

## Patent claims:

1. A monomeric or multimeric amidase characterized in that the amidase contains an N-terminal sequence  
5 **SEQ ID No. 1** or an N-terminal sequence having a homology of greater than 50% with **SEQ ID No. 1**.
2. A monomeric or multimeric amidase characterized in that the amidase contains a sequence **SEQ ID No. 2**  
10 or a sequence having a homology of greater than 50% with **SEQ ID No. 2**.
3. The monomeric or multimeric amidase as claimed in one of claims 1 and 2, characterized in that the  
15 amidase contains an N-terminal sequence **SEQ ID No. 1** and **SEQ ID No. 2** or an N-terminal sequence having a homology of greater than 50% with **SEQ ID No. 1** and a sequence having a homology of greater than 50% with **SEQ ID No. 2**.
- 20 4. The amidase as claimed in one of claims 1 to 3 having a molecular weight of the native monomeric enzyme between 47 and 53 kDa.
- 25 5. The amidase as claimed in one of claims 1 to 4, characterized in that the enzyme is obtainable from thermophilic bacteria.
- 30 6. The amidase as claimed in one of claims 1 to 4, characterized in that the enzyme is obtainable from Actinomycetes.
- 35 7. The amidase as claimed in one of claims 1 to 4, characterized in that the enzyme is obtainable from *Pseudonocardia thermophila*.
8. The amidase as claimed in one of claims 1 to 7, obtainable by a method comprising the method steps

- a) centrifugation of the cell-free crude extract of a thermophilic bacterium at 10 000 to 20 000 rpm and subsequent addition of a 1 M salt solution,
  - 5 b) chromatographic separation of the supernatant on a hydrophobic column using a reverse gradient of a salt solution from 1 M to 0 M,
  - c) ultrafiltration of the fraction showing amidase activity obtained from b) on a 10 kDa cut-off  
10 membrane,
  - d) ion-exchange chromatography of the protein fraction obtained from c) using a gradient from 0 M to 0.5 M of a salt solution,
  - e) chromatography of the fraction showing amidase  
15 activity obtained from d) using a 100 to 200 mM salt solution and desalting the purified amidase fraction.
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9. The amidase as claimed in one of claims 1 to 8,  
20 characterized in that the N-terminal end of the amidase containing the **SEQ ID No. 1** or a sequence having a homology of greater than 50% with **SEQ ID No. 1** is completely or partly deleted.
  - 25 10. The amidase as claimed in one of claims 1 to 9, characterized in that the **SEQ ID No. 2** or a sequence having a homology of greater than 50% with **SEQ ID No. 2** of the amidase is completely or  
30 partly deleted.
  11. The amidase as claimed in one of claims 1 to 10, characterized in that the enzyme is present as monomer or dimer, consisting of two monomeric amidase units as claimed in one of claims 1 to 10.
  - 35 12. The amidase as claimed in one of claims 1 to 10, characterized in that the enzyme has an amino acid sequence according to **SEQ ID No. 3** or an amino acid sequence having a homology of at least 50%

therewith.

13. A nucleic acid coding for an inventive amidase as claimed in one of claims 1 to 12, characterized in that the nucleic acid has a sequence according to **SEQ ID No. 4** or a nucleotide sequence having a homology of greater than 60% therewith.  
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14. The use of amidases as claimed in one of the preceding claims for the hydrolysis of amides or for acylation.  
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15. The use of amidases as claimed in claim 14 for the hydrolysis of aliphatic amides, aromatic amides, cyclic amides, heterocyclic amides or amino acid amides.  
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16. The use of amidases as claimed in claim 15 for the enantioselective hydrolysis of amides.  
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17. The use of amidases as claimed in claim 16 for preparing *S*-stereoisomeric acids.
18. A method for the enzymatically catalyzed hydrolysis of amides, characterized in that the reaction is catalyzed by an amidase as claimed in claims 1 to 13.  
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19. The method as claimed in claim 18, characterized in that the reaction is carried out at a temperature between 30°C and 85°C.  
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20. The method as claimed in claim 19, characterized in that the reaction is carried out at a temperature between 50°C and 75°C.  
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21. The method as claimed in one of claims 18 to 20, characterized in that the reaction proceeds at a pH between 3.5 and 11.5.